

1966 OPERATING SUMMARY

TIMMINS

water pollution control plant



ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Timmins Local Advisory Committee,
Timmins, Ontario.

Gentlemen;

We are pleased to submit to you the 1966 Operating Summary for the
Timmins Water Pollution Control Plant, OWRC Project No. 60-S-71.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly", is written over the typed name.

D. S. Caverly,
General Manager.



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Timmins Water Pollution Control Plant, OWRC Project No. 60-S-71.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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TIMMINS

water pollution control plant

operated for

THE TOWN OF TIMMINS

by the

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Assistant Director:	C. W. Perry
Regional Supervisor:	D. A. McTavish
Operations Engineer:	R. Kauppinen

801 Bay Street

Toronto 5

'66 REVIEW

The total operating cost for 1966 was \$31,647.82, an increase of 2.1% over the 1965 figure of \$31,001.30. However, the cost per million gallons of raw sewage treated decreased 4.2% from \$29.21 to \$27.98, and the cost per pound of BOD removed also decreased from three to two cents. Payroll, power and sundry were the three major expenditure items, and all three amounted to 76.5% of the total budget.

A total of 1,131 million gallons of waste was treated during 1966. This was a 6.6% increase over the 1965 flows. The average daily flow during 1966 was 3.10 mgd compared to 2.90 mgd in 1965. BOD and suspended solids removals averaged 67.0% and 59.5% respectively for the year.

During 1966, 635,810 cubic feet of raw sludge were pumped to the digester and 117,260 cubic feet of digested sludge were hauled. Gas production during the year amounted to 3,872,340 cubic feet.

During the summer months, 28,710 pounds of chlorine were used to disinfect the plant effluent at an average dosage rate of 5.32 ppm.

In general, the plant operated well, with very good removal efficiencies for primary treatment. In the latter part of 1966, a regular digested sludge hauling program was established in an effort to increase the efficiency of the digestion process.

PROJECT COSTS

NET CAPITAL COST (Final)	\$785,370.12
DEDUCT - Portion Financed by CMHC (Estimated)	<u>521,108.36</u>
Long Term Debt to OWRC	<u>\$264,261.76</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966	\$ <u>20,121.82</u>
Net Operating	\$ 31,647.82
Debt Retirement	9,586.00
Reserve	5,284.16
Interest Charged	14,863.01
TOTAL	\$ <u>61,380.99</u>

RESERVE ACCOUNT

Balance at January 1, 1966	\$ 5,511.84
Deposited by Municipality	5,284.16
Interest Earned	<u>420.51</u>
Less Expenditures	<u>-</u>
Balance at December 31, 1966	\$ <u>11,216.51</u>

MONTHLY OPERATING COSTS

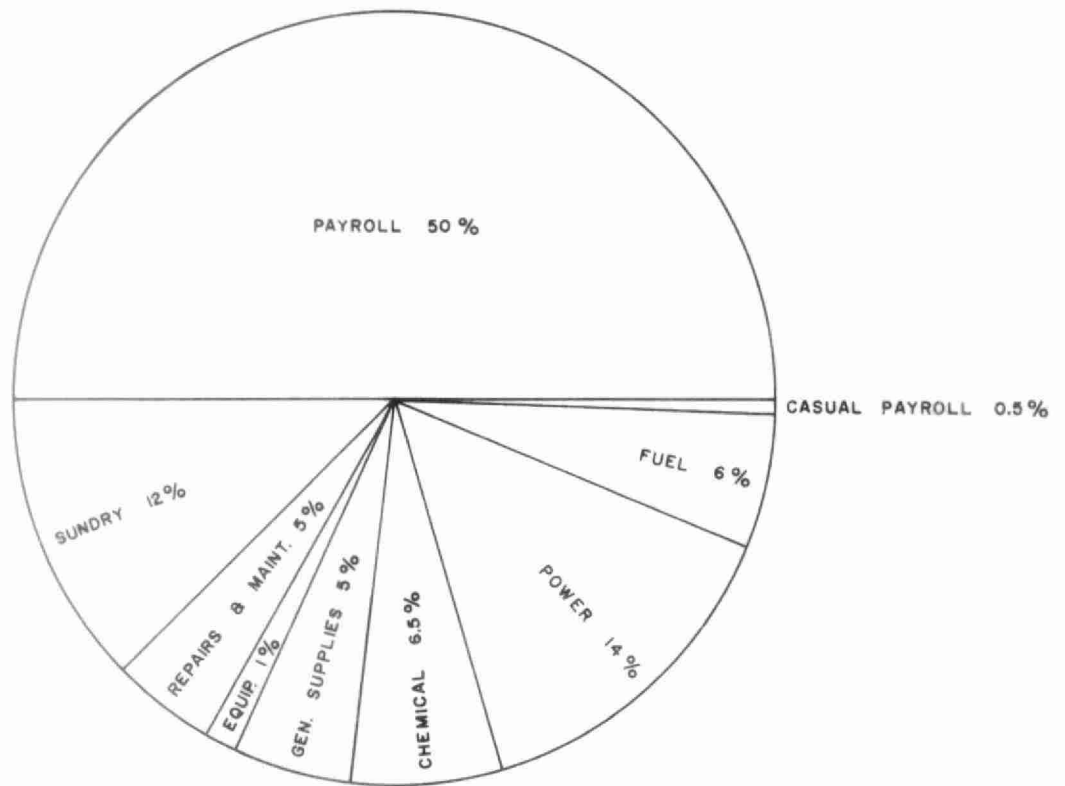
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY
JAN	1601.77	1109.14		35.60	399.96		57.07			
FEB	2155.11	1115.31		213.60	464.51		55.05	29.25	242.42	34.27
MARCH	2905.47	1175.20		423.64	445.50	9.74	106.22	51.50	71.26	611.71
APRIL	3596.21	1700.52			349.93	1009.40	245.66	11.69	225.54	50.43
MAY	3599.76	1145.69			343.08		113.96	28.21	70.90	1897.39
JUNE	2536.12	1300.75		266.25	419.40		229.14		241.63	72.67
JULY	1713.48	1145.58			349.00		97.61	2.56	39.40	79.15
AUG	2912.93	1241.32			315.23	1629.00	102.25		210.63	44.29
SEPT	3262.45	2198.63		284.04	340.48		91.52	121.36	159.39	56.33
OCT	2117.99	1193.64		60.75	347.23		106.38	41.37	34.26	361.31
NOV	1931.80	1238.35		100.50	375.28		74.37		4.64	162.56
DEC	3154.83	1167.04	143.61	373.75	355.24		257.56	116.15	165.93	552.50
TOTAL	31647.82	15719.78	103.61	1572.13	3605.15	2648.14	1537.49	412.21	1466.10	3937.41

YEARLY OPERATING COSTS

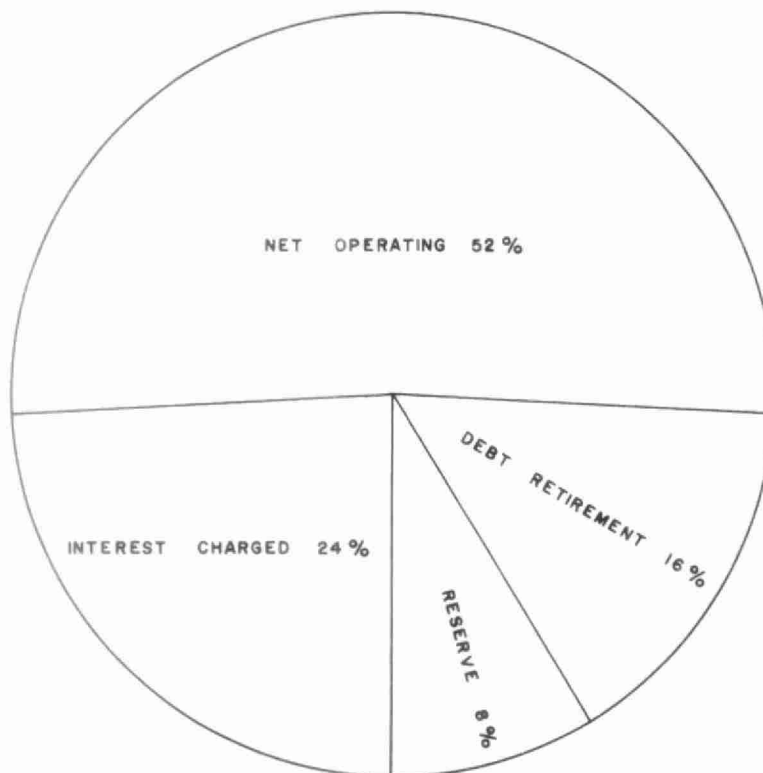
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1965	1061,286	\$31001.30	* \$4.17	\$29.21	3 CENTS
1966	1130,981	\$31647.82	\$4.25	\$27.98	2 CENTS

* BASED ON ESTIMATED ANNUAL POPULATION AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



TOTAL ANNUAL COST



Process Data

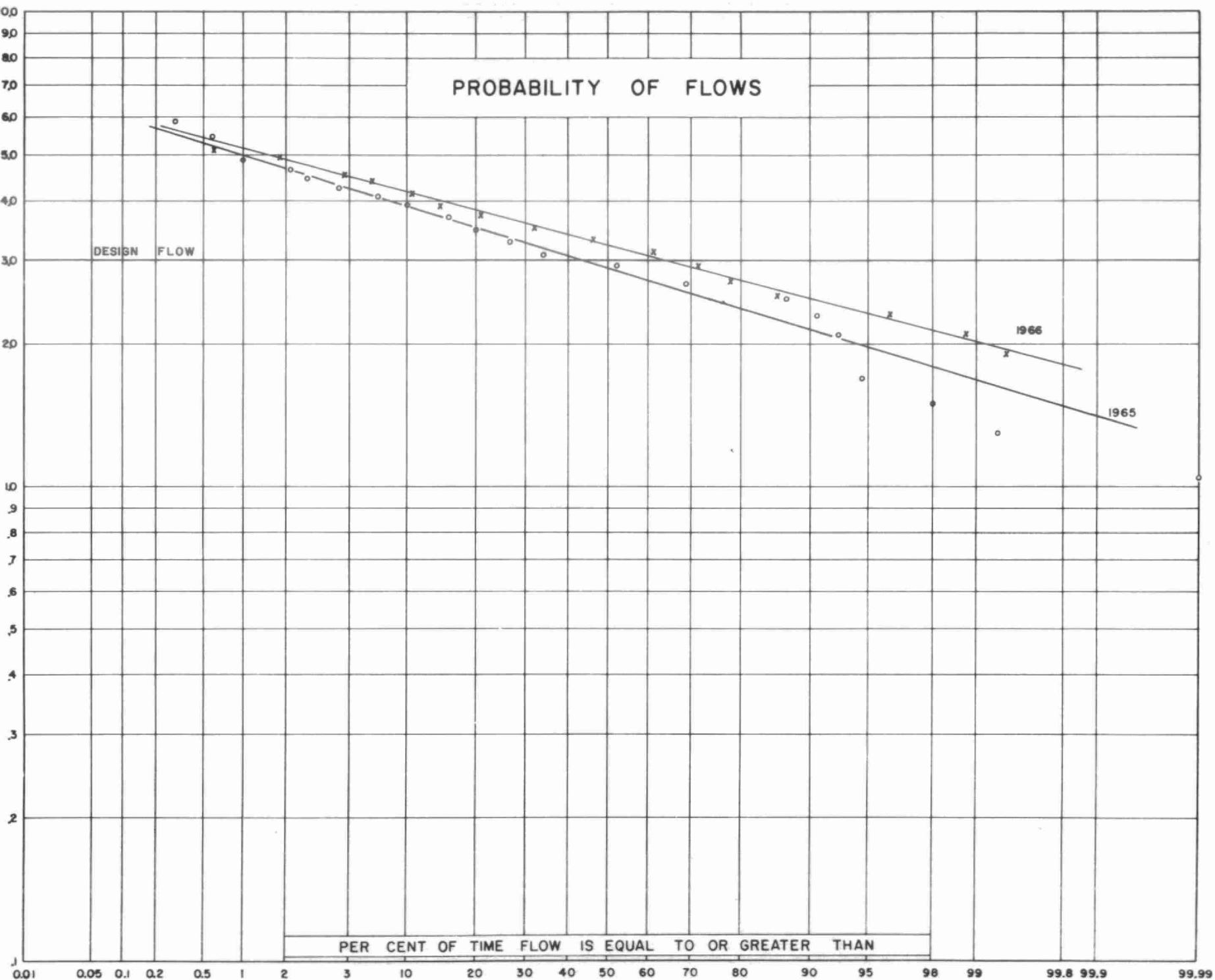
On the average daily flow plot, an increasing trend may be seen during 1966. From the probability plot, it may be seen that during 1965, the average daily flow was in excess of the plant design capacity of 3.0 mgd approximately 45% of the time; whereas during 1966, the plant design capacity was exceeded 63% of the time. It should be noted that the 3.0 mgd design capacity is a conservative design figure.

AVERAGE DAILY FLOW (MGD)

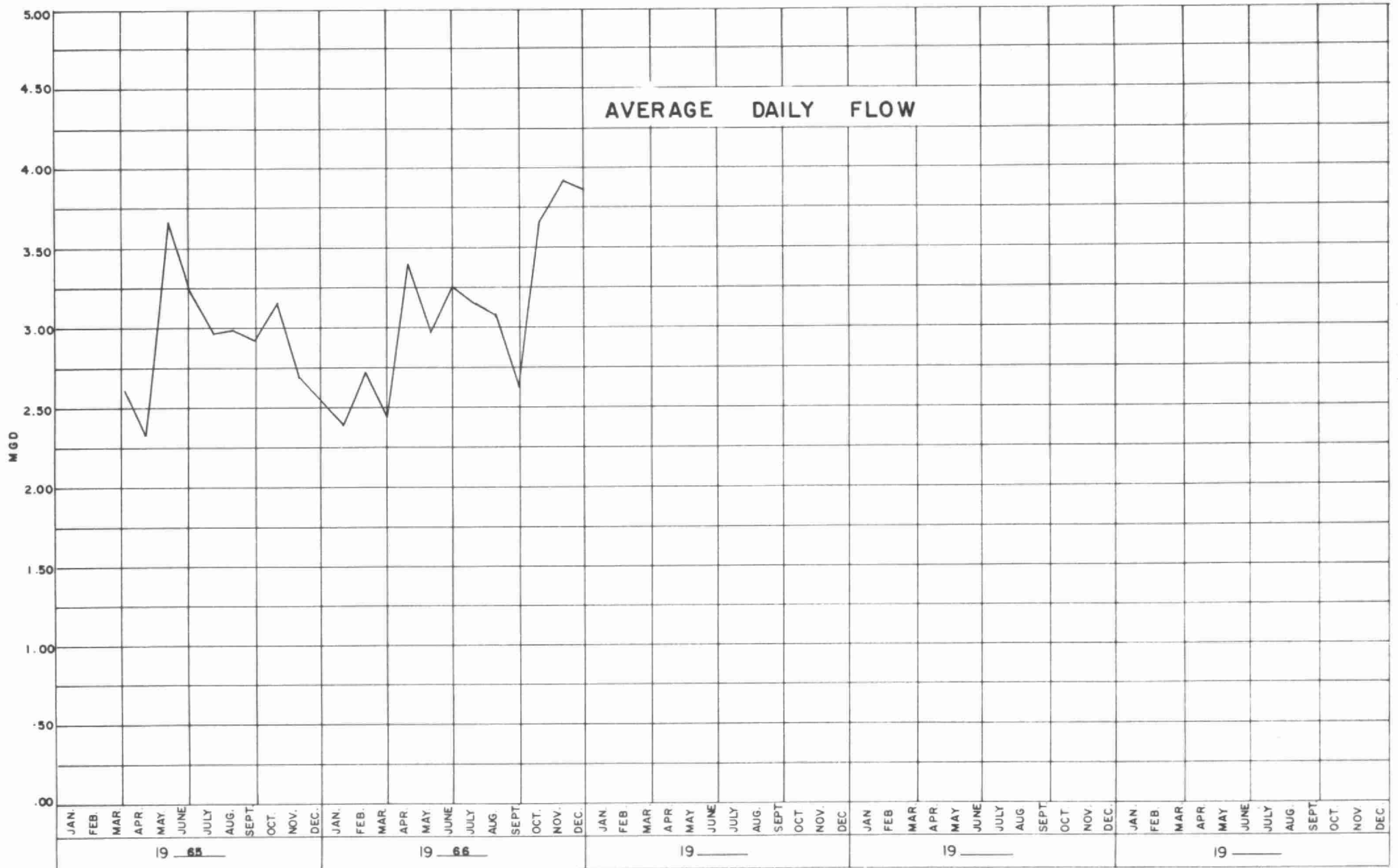
PROBABILITY OF FLOWS

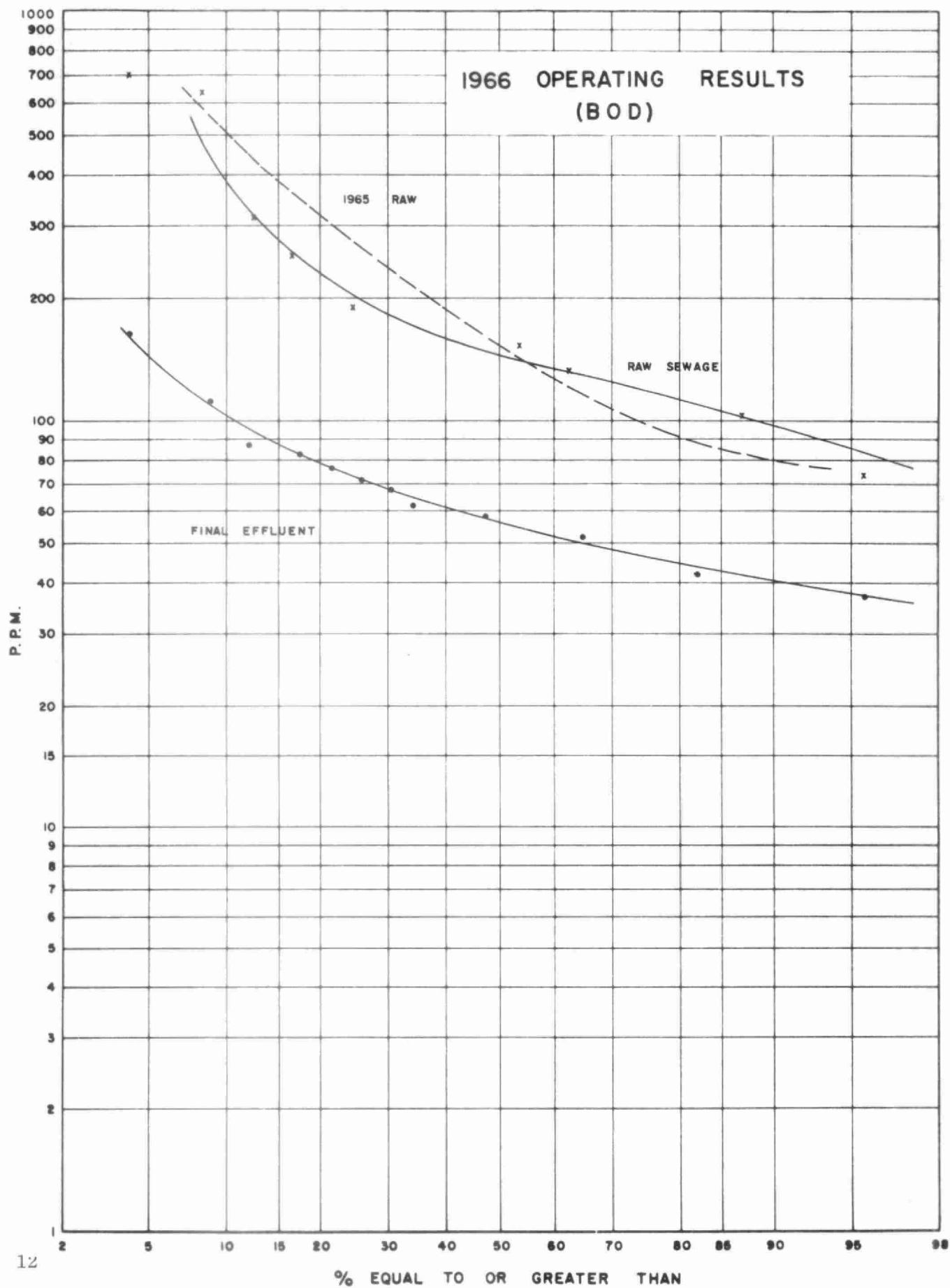
DESIGN FLOW

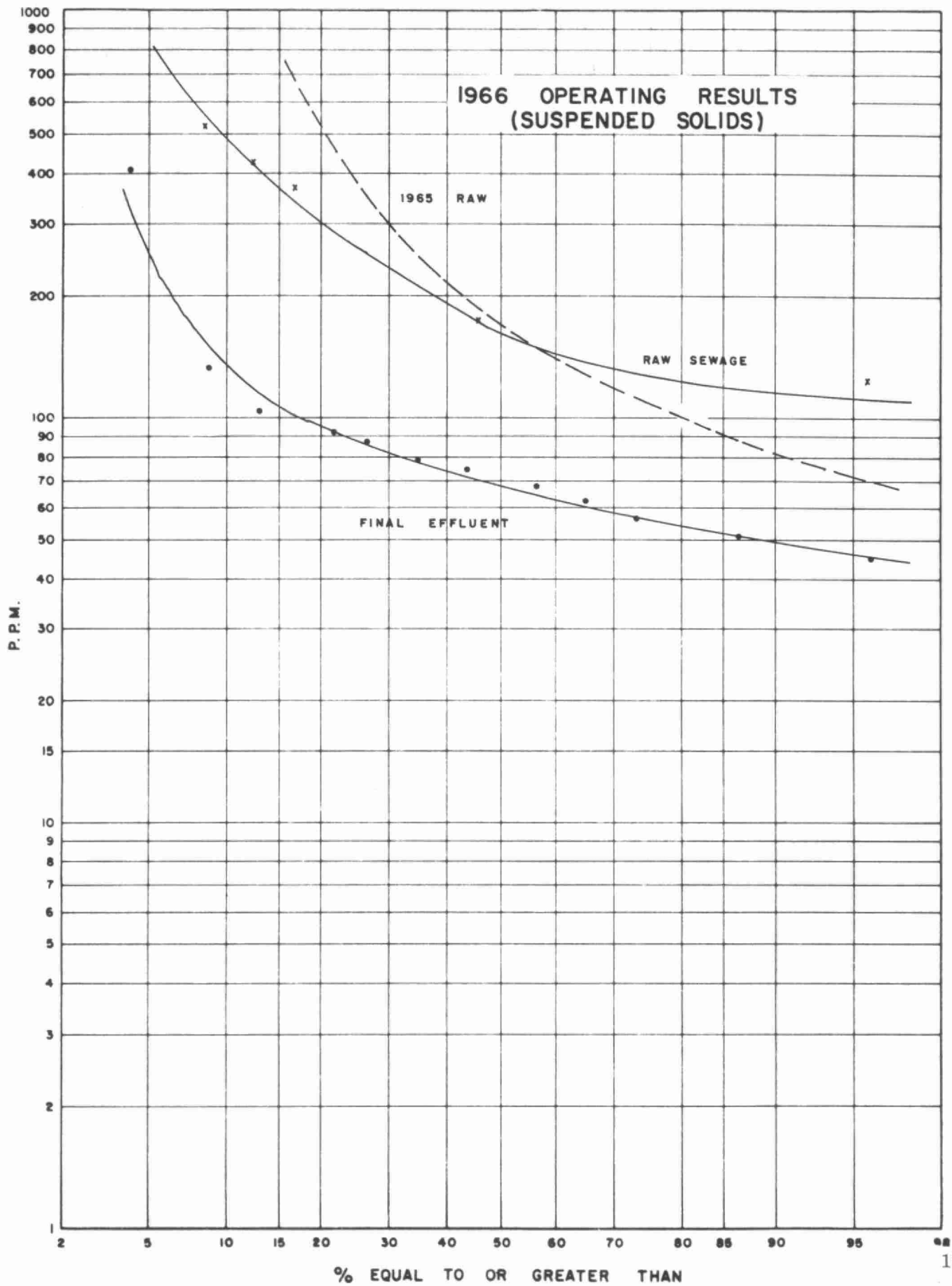
PER CENT OF TIME FLOW IS EQUAL TO OR GREATER THAN

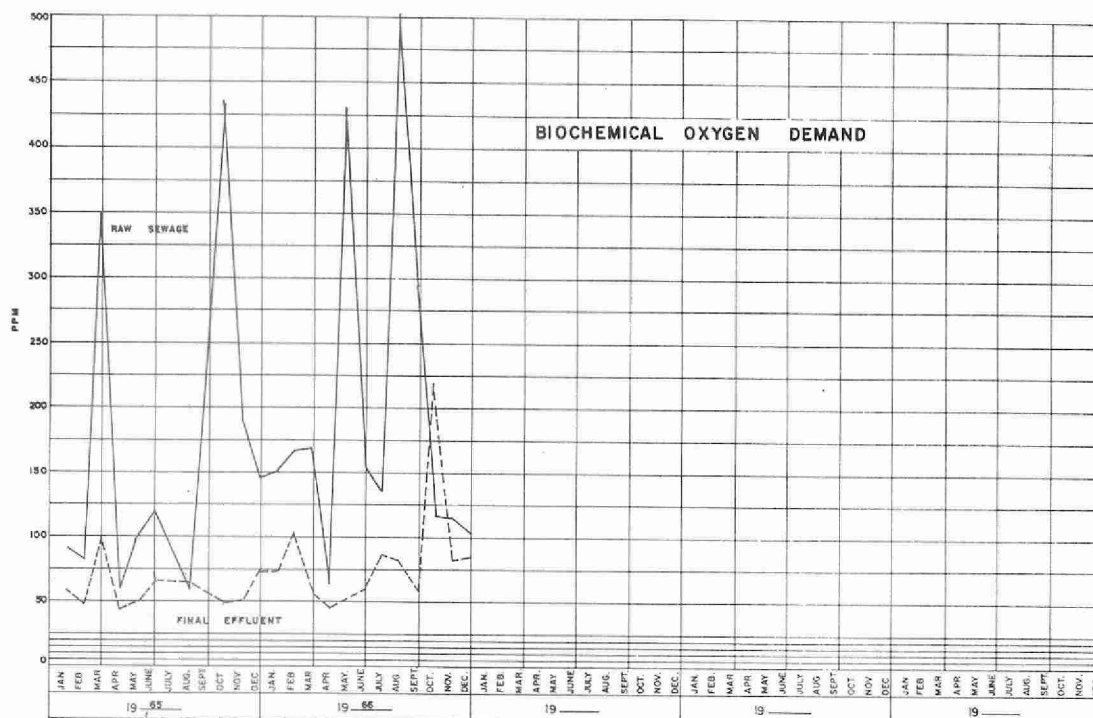


AVERAGE DAILY FLOW

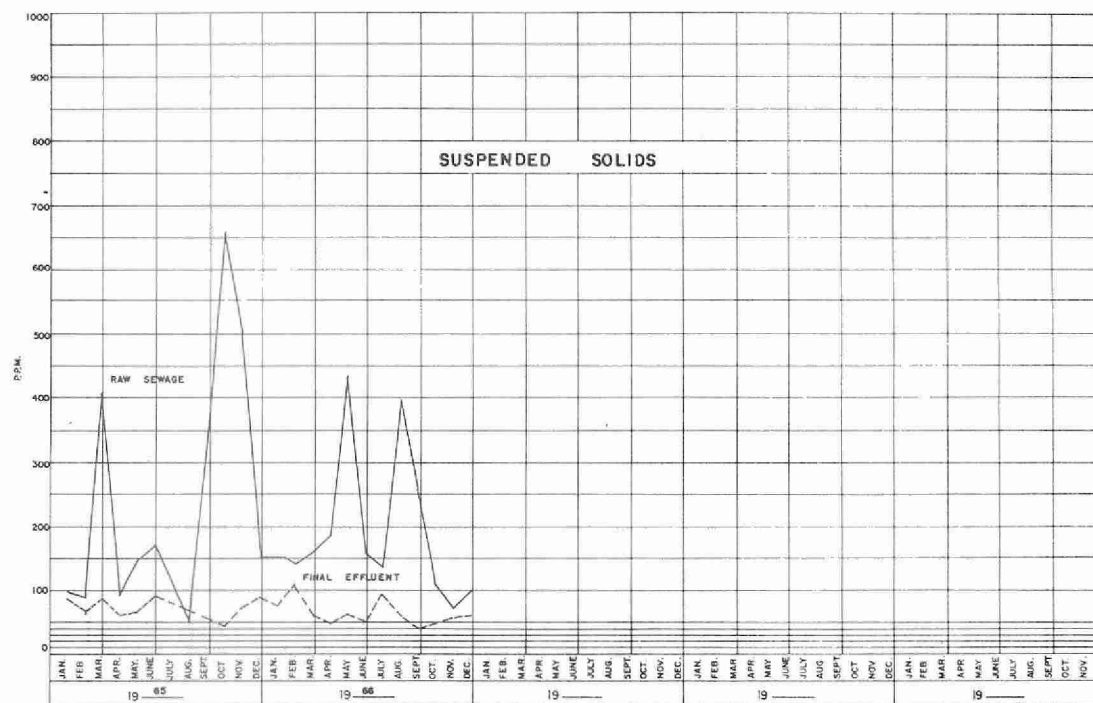








MONTHLY VARIATIONS



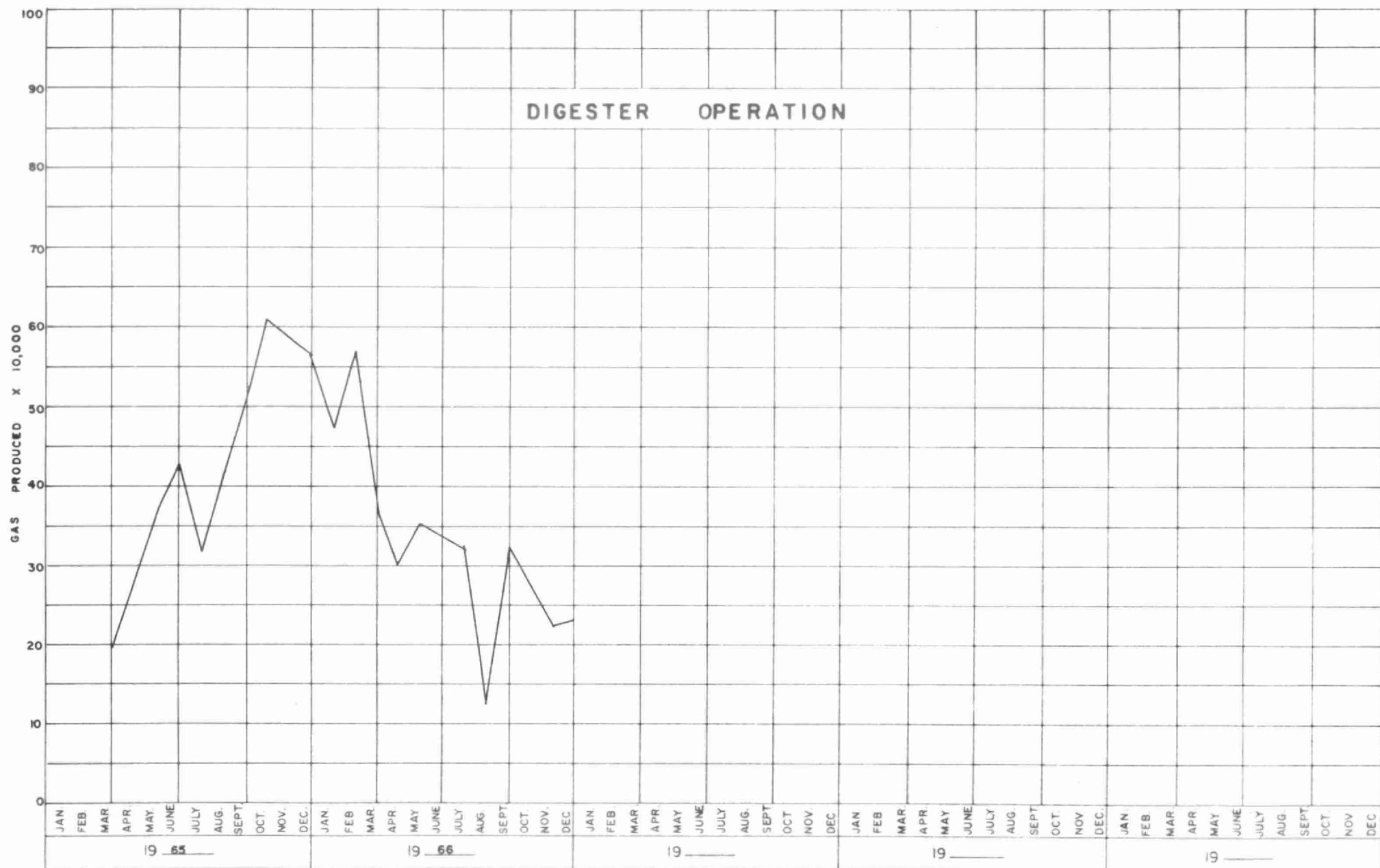
GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	150	72	52.0	28.8	150	88	41.5	22.9	151
FEB.	140	102	27.0	14.5	166	108	35.0	22.1	140
MAR.	157	57	63.5	37.6	167	62	63.0	39.5	161
APR.	183	44	76.0	71.3	62	49	21.0	6.7	153
MAY	432	60	86.0	171.0	329	50	85.0	128.2	212
JUNE	154	50	67.5	51.1	280	58	79.5	109.1	172
JULY	135	91	32.5	21.5	135	85	37.0	24.5	174
AUG.	395	70	82.0	156.1	621	80	87.0	259.8	156
SEPT.	255	38	85.0	89.1	295	57	80.5	97.7	170
OCT.	102	45	56.0	32.6	115	220	0.0	0.0	160
NOV.	70	52	25.5	9.9	114	80	30.0	18.7	178
DEC.	95	57	40.0	21.3	103	83	19.5	11.2	154
TOTAL	-	-	-	718.2	-	-	-	712.5	1981
AVG.	189	62	67.0	59.8	211	85	59.5	59.4	165

COMMENTS

During 1966, a total of 718.2 tons of BOD was removed from the raw sewage. The average BOD concentration of the influent was 189 ppm, and it was 62 ppm in the effluent, giving a mean removal efficiency of 67.0%. Similarly, for suspended solids, the plant loading totalled 712.5 tons and the average suspended solids concentration in the raw waste was 211 ppm for the year. The average effluent concentration of suspended solids was 85 ppm and the mean removal efficiency was 59.5%.

A total of 1981 cubic feet of grit was removed throughout the year. This is equivalent to an average of 5.44 cubic feet per day or approximately 1.76 cubic feet per million gallons.



DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu Ft
	*1000'S CU FT.	% SOLIDS	% VOL. MAT.	1000'S CU FT.	% SOLIDS	% VOL. MAT.	
JAN.	50.08	-	-	-	-	-	471.92
FEB.	45.23	-	-	0.88	-	-	564.18
MAR.	48.48	-	-	4.58	-	-	368.82
APR.	48.46	-	-	-	-	-	297.16
MAY	50.08	-	-	1.41	-	-	350.31
JUNE	48.46	-	-	-	-	-	332.75
JULY	61.32	-	-	10.56	-	-	313.88
AUG.	49.74	-	-	50.26	-	-	127.06
SEPT.	50.08	-	-	17.54	-	-	321.21
OCT.	50.07	-	-	14.98	-	-	275.70
NOV.	58.69	3.85	3.05	-	7.44	3.49	221.10
DEC.	75.12	2.06	1.56	17.05	6.18	3.03	228.31
TOTAL	635.81	-	-	117.26	-	-	3872.34
AVG.	52.98	2.96	2.30	9.77	6.81	3.26	322.70

* Calculated on an average estimated discharge rate of 35 IGPM.

COMMENTS

The total raw sludge volume pumped to the digester in 1966 was 635,810 cubic feet, of which 2.3% was volatile solid matter. Sludge hauling during the year amounted to 117,260 cubic feet, of which 3.26% was volatile solid matter. Gas production during 1966 totalled 3,872,340 cubic feet.

Late in the year, a study was made on the digester process and as a result a regular sludge hauling program was established. To increase the efficiency of the digestion process, it is recommended that some form of mixing be installed to maintain a more homogeneous, actively digesting sludge in the digester.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	73.854	-	-
FEBRUARY	76.356	-	-
MARCH	75.175	-	-
APRIL	102.551	-	-
MAY	91.918	* 1930	3.83
JUNE	98.324	4330	4.40
JULY	97.910	6390	6.53
AUGUST	96.049	5870	6.11
SEPTEMBER	82.132	5270	6.42
OCTOBER	114.488	4920	4.30
NOVEMBER	109.966	-	-
DECEMBER	112.258	-	-
TOTAL	1130.981	28710	-
AVERAGE	94.248	4785	5.32

* 17 days' chlorination

COMMENTS

From May 15 to October 31, chlorine was added to the final effluent as a disinfectant. A total of 28,710 pounds of chlorine was used which averaged to 166 pounds per day. To maintain the required 0.5 ppm chlorine residual after 15 minutes' contact time, an average dosage rate of 5.32 ppm was required.



CONCLUSIONS

The plant functioned well during 1966 and high removal efficiencies were achieved. The organic loading on the plant was approximately equal to design values. The hydraulic loading exceeded design values approximately 63% of the time. However, as mentioned before the design capacity of 3.0 is a conservative design capacity. A more efficient digester operation could be expected with the installation of digester mixing equipment.

RECOMMENI

It is recommended to improve the digestion

Date Due

gester to

